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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 10/670,673 | 09/25/2003 | Bruce K. Wachtmann | 2550/185 | 6398 |

2101 7590 11/28/2005

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| EXAMINER | |
|---|---|
| PIZARRO CRESPO, MARCOS D | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2814 | |

DATE MAILED: 11/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/670,673 | WACHTMANN, BRUCE K. | |
| | Examiner | Art Unit | |
| | Marcos D. Pizarro-Crespo | 2814 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *07 November 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1,3-5 and 7-20* is/are pending in the application.

4a) Of the above claim(s) *9-14 and 20* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-5,7,8 and 15-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claim(s) *1,3-5 and 7-20* are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Attorney's Docket Number: 2550/185
Filing Date: 9/25/2003
Claimed Priority Date: 12/3/2002 (CIP of 10/308,688)
Applicant(s): Wachtmann
Examiner: Marcos D. Pizarro-Crespo

## DETAILED ACTION

This Office action responds to the amendment filed on 11/7/2005.

### *Continued Examination Under 37 CFR 1.114*

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after the final rejection mailed on 8/9/2005. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 11/7/2005 has been entered.

### *Acknowledgment*

2. The amendment filed on 11/7/2005 responding to the Office action mailed on 8/9/2005 has been entered. The present Office action is made with all the suggested amendments being fully considered. Accordingly, pending in this Office action are claims 1, 3-5, and 7-20.

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 3-5, 7, 8, and 15-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Montague (US 5798283).

5. Regarding claim 1, Montague shows (see, *e.g.*, fig. 1) all aspects of the instant invention including a method of forming a surface micromachined MEMS device **12**, the method comprising:

- ✓ Providing a substrate **14**
- ✓ Applying an oxide **22** on the substrate **14** (see, *e.g.*, col.5/ll.30-35)
- ✓ Depositing a conductive path **24** on the oxide **22**
- ✓ Forming circuitry **16** and structure **26**
- ✓ Connecting the path **24** between the circuitry **16** and the structure **26**

wherein:

- ✓ The conductive path **24** is capable of transmitting an electronic signal between the circuitry **16** and the structure **26**
- ✓ The oxide **22** spaces the path **24** from the substrate **14**
- ✓ The device **12** is free of semiconductor junctions formed by the substrate **14** and the conductive path **24**

6. Regarding claims 3 and 16, Montague shows the structure **26** is electrically isolated from the substrate **14** (see, *e.g.*, fig. 1).

7. Regarding claims 4 and 18, Montague shows (see, *e.g.*, fig. 10) the method further comprising:

- ✓ Applying an additional insulator **42** above the conductive path **24**
- ✓ Depositing an additional conductive path **44** to the additional insulator **42**

wherein the conductive path **24** and the additional conductive path are in different planes of the device.

8. Regarding claim 5, Montague shows the method further comprising electrically connecting the conductive path **24** and the additional conductive path **44** with a connector **28**, the connector **28** being one of a via and a staple (see, *e.g.*, fig. 10).

9. Regarding claim 7, Montague shows the substrate **14** is free of embedded electrodes (see, *e.g.*, fig. 2).

10. Regarding claim 8, Montague shows the conductive path **24** comprises polysilicon (see, *e.g.*, col.6/ll.47).

11. Regarding claim 15, Montague shows (see, *e.g.*, fig. 1) all aspects of the instant invention including a method of forming a sensor, the method comprising:

- ✓ Forming an oxide **22** on a substantially intrinsic semiconductor substrate **14** (see, *e.g.*, col.5/ll.30-35 and col.4/ll.45)
- ✓ Forming a conductive path **24** on the oxide **22**
- ✓ Forming circuitry **16** and structure **26**
- ✓ Connecting the path **24** between the circuitry **16** and the structure **26**

wherein:

- ✓ The oxide **22** and the conductive path **24** are formed by surface micromachining processes (see, *e.g.*, col.5/ll.50-55)
- ✓ The oxide **22** electrically isolates the conductive path **24** from the substrate **14**
- ✓ The conductive path **24** is capable of transmitting an electronic signal between the circuitry **16** and the structure **26**

12. Regarding claim 17, Montague shows the MEMS device **12** is free of semiconductor junctions between the substrate **14** and the conductive path **24** (see, *e.g.*, fig. 1).

***Claim Rejections - 35 USC § 103***

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

14. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Montague in view of Fladre (US 2004/0152272).

15. Regarding claim 19, Montague shows most aspects of the instant invention (see, *e.g.*, paragraph 11 above). Montague also teaches that the oxide has a thickness of about .06 μm (see, *e.g.*, col.5/ll.30-32) but fails to show the claimed thickness of .15 to 1.5 μm. However, differences in thickness will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such

differences are critical. "Where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the workable ranges by routine experimentation". *In re Aller*, 220 F.2d 454,456,105 USPQ 233, 235 (CCPA 1955). Along these lines, Fladre teaches (see, *e.g.*, par. 0050) that the larger the thickness of Montague's oxide layer is, the more the parasitic capacitance between the conductive path and the substrate will be reduce. The original thickness of Fladre's oxide layer ranges from .400 to 1.000 μm (see, *e.g.*, par. 0048).

Based on the teachings of Fladre, the specific claimed thicknesses, are only considered to be the "optimum" thicknesses disclosed by Montague that a person having ordinary skill in the art would have been able to determine using routine experimentation based, among other things, on the desired reduction in parasitic capacitance, manufacturing costs, etc. (see Boesch, 205 USPQ 215 (CCPA 1980)), and since neither non-obvious nor unexpected results, *i.e.*, results which are different in kind and not in degree from the results of the prior art, will be obtained as long as an oxide insulator separates the conductive path from the substrate, as already suggested by Barron.

Accordingly, since the applicants have not established the criticality (see next paragraph below) of the stated thicknesses and since these thicknesses have been in common use in similar devices in the art, as shown by Fladre, it would have been obvious to one of ordinary skill in the art to use these values in the method of Montague.

CRITICALITY

16. The specification contains no disclosure of either the critical nature of the claimed thicknesses or any unexpected results arising therefrom. Where patentability is said to be based upon particular chosen dimensions or upon another variable recited in a

claim, the applicant must show that the chosen dimensions are critical. *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

### *Response to Arguments*

17. The applicant argues:

**The prior art of record does not show the method step of depositing a conductive path on an oxide, which itself was applied on a substrate. Instead the prior art deposits the conductive path on a nitride layer.**

The examiner responds:

The fact that the Montague's path is on a nitride layer, does not oppose the fact that it is also on an oxide layer. See, e.g., fig. 1 and col.5/ll.30-35, where Montague shows that the conductive path is also on an oxide, which itself was applied on a substrate. There is no limitation whatsoever in the claim language precluding the conductive path from being *above and supported by* other layers in addition to the oxide layer.

### *Conclusion*

18. Papers related to this application may be submitted directly to Art Unit 2814 by facsimile transmission. Papers should be faxed to Art Unit 2814 via the Art Unit 2814 Fax Center. The faxing of such papers must conform to the notice published in the Official Gazette, 1096 OG 30 (15 November 1989). The Art Unit 2814 Fax Center number is **(571) 273-8300**. The Art Unit 2814 Fax Center is to be used only for papers related to Art Unit 2814 applications.

19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Marcos D. Pizarro-Crespo** at **(571) 272-1716** and between the hours of 9:30 AM to 8:00 PM (Eastern Standard Time) Monday through

Thursday or by e-mail via Marcos.Pizarro@uspto.gov. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy, can be reached on (571) 272-1705.

20. Any inquiry of a general nature or relating to the status of this application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

21. The following list is the Examiner's field of search for the present Office Action:

| Field of Search | Date |
|---|---|
| U.S. Class / Subclass(es): 438/52, 453 | 11/18/2005 |
| Other Documentation: PLUS Analysis | 5/12/2005 |
| Electronic Database(s): EAST (USPAT, EPO, JPO) | 11/18/2005 |

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MDP/mdp
November 18, 2005